

occurred at intervals in the interior of New England, were successfully forecast.—*J. W. Smith, Forecast Official.*

NEW ORLEANS FORECAST DISTRICT.

The following special warning was issued at 12:15 p. m. of the 18th: "Squalls, with brisk and occasionally high winds are indicated for the west Gulf this afternoon and to-night." Unusually severe squalls occurred Sunday afternoon and night over southern Texas and along the coast. At Goliad, Tex., a tornado killed 200 people and destroyed much property.—*J. M. Cline, Forecast Official.*

CHICAGO FORECAST DISTRICT.

No severe storms occurred on the upper lakes, and no mishaps of moment were reported. Frosts occurred in the western Lake region and in the Northwest several times during the month. Previous to their occurrence warnings were generally issued, and it is not thought that any serious damage resulted. There were a number of thunderstorms during the month, which caused an unusually large amount of rainfall in nearly all sections, making up to a large extent for the drought which prevailed during the fall and winter. These thunderstorms were almost invariably correctly forecast.—*H. J. Cor, Professor.*

DENVER FORECAST DISTRICT.

Special warnings were given distribution on the 18th for the heavy frost that visited Utah and western Colorado. Frosts that occurred in the agricultural districts on other dates, except in northern New Mexico, were generally covered in the daily forecasts.—*F. H. Brandenburg, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

An area of high pressure off the central coast on May 17 and, at the same time, an extensive trough of low pressure over the Rocky Mountain region, were accompanied by high winds generally in California and Nevada. Especially in the vicinity of Point Reyes did the winds reach a high velocity; a maximum of 108 miles and an extreme velocity of 120 miles being reported at that station on the 18th.—*A. G. McAdie, Professor.*

PORTLAND, OREG., FORECAST DISTRICT.

No severe storms occurred during the month. Frosts which, as a rule, were accurately forecast occurred frequently in the eastern sections from the 2d to the 5th, and occasionally until the close of the month.—*E. A. Beals, Forecast Official.*

RIVERS AND FLOODS.

The mean stages in the upper Mississippi River averaged from 2.5 to 5.5 feet higher than during the preceding month. They were also somewhat higher than during the correspond-

ing period of the preceding year. The lower Mississippi, the Ohio, and the Tennessee, fell steadily, but remained at an excellent navigable stage at the close of the month.

The rivers of the East and South were lower, except the Brazos, where there was a considerable rise, due to heavy local rains. During the last days of the month there was also a sharp rise in the Arkansas River on account of continued heavy rains over its upper watershed, and some reports of flooding and damage were received from the Kansas portion.

West of the Rocky Mountains the feature of interest was the annual rise of the Columbia River which began on the 15th of the month. Its coming was well heralded, and ample time was afforded for all necessary preparations.

The highest and lowest water, mean stage, and monthly range at 138 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	*29, p.m.	50	100	4, p.m.	46	60	2,250	5.0	450	18.8
II.....	2, p.m.	41	124	7, a.m.	45	64	3,550	4.5	789	32.9
III.....	7, p.m.	54	114	8, a.m.	38	86	3,350	5.5	609	25.4
IV.....	12, p.m.	53	108	12, p.m.	46	60	2,900	5.0	580	24.2
V.....	20, a.m.	48	86	17, a.m.	32	65	2,875	4.5	639	26.6
VI.....	24, p.m.	54	114	23, a.m.	32	65	1,900	3.0	633	26.4
VII.....	30, a.m.	48	86	30, a.m.	36	76	2,450	5.5	445	18.6
				31, p.m.	41	70	900	1.5	600	25.0
Sums.....							20,175	34.5	4,745	197.9
Mean of 8 paths.....							2,522		593	24.7
Mean of 34.5 days.....									585	24.4
Low areas.										
I.....	*30, a.m.	41	112	4, a.m.	32	65	3,350	4.0	838	34.9
II.....	2, p.m.	38	105	6, a.m.	46	60	2,700	3.5	771	32.1
III.....	5, p.m.	41	97	7, p.m.	48	68	1,600	2.0	800	33.3
IV.....	5, p.m.	32	94	8, a.m.	35	76	1,050	1.5	700	29.2
V.....	6, p.m.	54	114	10, a.m.	46	60	2,550	3.5	728	30.3
VI.....	17, a.m.	46	106	20, p.m.	51	104	2,000	3.5	571	23.8
VII.....	25, a.m.	42	83	28, a.m.	48	68	975	3.0	325	13.5
Sums.....							14,225	21.0	4,783	197.1
Mean of 7 paths.....							2,032		676	28.2
Mean of 21.0 days.....									678	28.2

*April.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*Geo. E. Hunt, Chief Clerk, Forecast Division.*

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following summaries relating to the general weather and crop conditions are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau:

Alabama.—Conditions favorable for cultivation, but generally too dry for late planted staple crops, particularly so in some northern counties, where a drought, which began about April 17, continued practically unbroken.—*Frank P. Chaffee.*

Arizona.—Unseasonably cold weather, extreme aridity of the atmosphere, high, drying winds, and an insufficient supply of water in the irri-

gated districts, combined to produce very unfavorable conditions for plant development during the month. The quality of the hay crop was below the average. The ranges had a scanty supply of feed and water, and were deteriorating at close of month.—*Wm. G. Burns.*

Arkansas.—The weather conditions during the month were generally favorable for farming operations, and work progressed rapidly. Corn planting was completed in some localities during the first week, and was completed in all sections by the close of the month. The early planted had generally come up to good stands and cultivation was well under way; some had been laid by during the last week. Cotton had begun to come up by the second week and was being chopped out in many sections;